

**South Carolina Alternate Assessment (SC-Alt)
Science Assessment Standards and Measurement Guidelines
DRAFT**

Theme 1: Scientific Inquiry

Prerequisite Skills:

- Use senses to identify objects and events. Use tools safely and appropriately to extend the senses.
- Predict and explain information or events based on observation or previous experiences. Infer explanations from scientific observations and information.
- Compare, classify, and sequence objects by number, shape, texture, size, color, or motion by using metric and standard units of measure as appropriate.
- Carry out simple scientific investigations when given clear directions.
- Use appropriate safety procedures when conducting investigations.
- Represent and communicate simple data and explanations through drawings, tables, graphs, and oral and written language.

Essence of 3–5 Standards:

- Scientific inquiry involves understanding and demonstrating scientific processes and skills. These processes and skills include generating questions and following procedures, selecting and using appropriate tools to safely collect data, and communicating the results for simple investigations by using mathematical thinking. These investigations involve independent, dependent, and controlled variables in content areas defined by grade-level life, earth, and physical science standards.
- Concepts of a fair investigation or a fair test and predictions, inferences, and conclusions should be developed in this grade band.

Theme 1: Scientific Inquiry	
State Academic Standard 3-5	3-5 Indicator Assessed
3-1: The student will demonstrate an understanding of scientific inquiry, including the processes, skills, and mathematical thinking to conduct a simple scientific investigation.	3-1.1: Classify objects by two of their properties (attributes).
	3-1.2: Classify objects or events in sequential order.
	3-1.3: Generate questions such as “what if?” or “how?” about objects, organisms, and events in the environment and use those questions to conduct a simple scientific investigation.
	3-1.4: Predict the outcome of a simple investigation and compare the result with the prediction.
	3-1.5: Use tools (including beakers, meter tapes and sticks, forceps/tweezers, tuning forks, graduated cylinders, and graduated syringes) safely, accurately, and appropriately when gathering specific data.
	3-1.6: Infer meaning from data communicated in graphs, tables, and diagrams.
	3-1.7: Explain why similar investigations might produce different results.
	3-1.8: Use appropriate safety procedures when conducting investigations.
4-1: The student will demonstrate an understanding of scientific inquiry, including the processes, skills, and mathematical thinking necessary to conduct a simple scientific investigation.	4-1.1: Classify observations as either quantitative or qualitative.
	4-1.2: Use appropriate instruments and tools (including a compass, an anemometer, mirrors, and a prism) safely and accurately when conducting simple investigations.

Theme 1: Scientific Inquiry	
State Academic Standard 3-5	3-5 Indicator Assessed
	4-1.3: Summarize the characteristics of a simple scientific investigation that represent a fair test (including a question that identifies the problem, a prediction that indicates a possible outcome, a process that tests one manipulated variable at a time, and results that are communicated and explained).
	4-1.4: Distinguish among observations, predictions, and inferences.
	4-1.5: Recognize the correct placement of variables on a line graph.
	4-1.6: Construct and interpret diagrams, tables, and graphs made from recorded measurements and observations.
	4-1.7: Use appropriate safety procedures when conducting investigations.
5-1: The student will demonstrate an understanding of scientific inquiry, including the foundations of technological design and the processes, skills, and mathematical thinking necessary to conduct a controlled scientific investigation.	5-1.1: Identify questions suitable for generating a hypothesis.
	5-1.2: Identify independent (manipulated), dependent (responding), and controlled variables in an experiment.
	5-1.3: Plan and conduct controlled scientific investigations, manipulating one variable at a time.
	5-1.4: Use appropriate tools and instruments (including a timing device and a 10x magnifier) safely and accurately when conducting a controlled scientific investigation.
	5-1.5: Construct a line graph from recorded data with correct placement of independent (manipulated) and dependent (responding) variables.
	5-1.6: Evaluate results of an investigation to formulate a valid conclusion based on evidence and communicate the findings of the evaluation in oral or written form.
	5-1.7: Use a simple technological design process to develop a solution or a product, communicating the design by using descriptions, models, and drawings.
	5-1.8: Use appropriate safety procedures when conducting investigations.

Theme 2: Organisms, Habitats, and Life Cycles

Prerequisite Skills:

- Identify human sense organs and structures used for motion, talking, holding, and so on.
- Differentiate between living and nonliving things.
- Describe basic needs of plants (air, water, nutrients, space, light), their general structures, their life cycles, and the environments in which they can grow.
- Describe basic needs of animals (air, food, water, shelter), their physical characteristics, their life cycles, and the environments in which they can live.
- Describe the interdependence of plants and animals for food and shelter.

Essence of 3–5 Standards:

- Each stage in the life cycle of organisms provides a distinct advantage to the organism for survival.
- Organisms are adapted to the environments in which they live. Animals use senses to learn about and survive in their environment.
- Organisms depend on living and nonliving components in their environments and habitats.
- Energy flows from plants and other producers (such as fungi) to consumers (animals) in food chains and food webs. Decomposers break down waste and return nutrients to the soil.

Essence of 6–8 Standards:

- Each structure of a plant and an animal has a distinct function for growth and reproduction. These structures and functions can change during the organism's life cycle.
- Animals have unique structures that allow them to move, which increases their ability to obtain resources and to protect themselves from danger.
- Animals have internal organs that work together in systems (digestion, respiration, circulation, sensory, motion). These internal structures can be affected or damaged by diseases and infections.

Theme 2: Organisms, Habitats and Life Cycles		
State Academic Standard 3-5	3-5 Indicator Assessed	3-5 Measurement Guidelines
3-2: The student will demonstrate an understanding of the structures, characteristics, and adaptations of organisms that allow them to function and survive within their habitats.	3-2.1: Illustrate the life cycles of seed plants and various animals and summarize how they grow and are adapted to conditions within their habitats.	MG 1: Identify parts of a plant and what a plant needs to grow (soil, water, sunlight).
	3-2.5: Summarize the organization of simple food chains (including the roles of producers, consumers, and decomposers).	MG 2: Match parents with young (plants and animals) at various stages in their life cycles.
		MG 3: Identify living and nonliving things in terms of a food web that includes humans. MG 4: Given nonliving and living things, identify foods derived from each.
4-2: The student will demonstrate an understanding of the characteristics and patterns of behavior that allow organisms to survive in their own distinct environments.	4-2.1: Classify organisms into major groups (including plants or animals, flowering or nonflowering plants, and vertebrates [fish, amphibians, reptiles, birds, and mammals] or invertebrates) according to their physical characteristics.	MG 5: Sort organisms by physical characteristics (same or different through identifying members of a group). MG 6: Match organisms with their environment (e.g., fish with lake, bird with forest, and alligator with swamp) and identify structures that allow the organism to survive in that environment.
	4-2.2: Explain how the characteristics of distinct environments (including swamps, rivers and streams, tropical rain forests, deserts, and the polar regions) influence the variety of organisms in each.	
5-2: The student will demonstrate an understanding of relationships among biotic and abiotic factors within terrestrial and aquatic ecosystems.	5-2.4: Identify the roles of organisms as they interact and depend on one another through food chains and food webs in an ecosystem, considering producers and consumers (herbivores, carnivores, and omnivores), decomposers (microorganisms, termites, worms, and fungi), predators and prey, and parasites and hosts.	

Theme 2: Organisms, Habitats and Life Cycles		
State Standard 6-8	6-8 Indicator Assessed	6-8 Measurement Guidelines
6-2: The student will demonstrate understanding of structures, processes, and responses of plants that allow them to survive and reproduce.	6-2.1: Summarize the characteristics that all organisms share (including the obtainment and use of resources for energy, the response to stimuli, the ability to reproduce, and process of physical growth and development).	MG 7: Identify common structures and/or characteristics of plants.
	6-2.5: Summarize each process in the life cycle of flowering plants (including germination, plant development, fertilization, and seed production).	MG 8: Describe similarities and differences among plants that include flowering plants, trees, and grasses.
	6-3.2: Summarize the basic functions of the structures of animals that allow them to defend themselves, to move, and to obtain resources.	MG 9: Describe the functions of identified physical structures in terms of movement, eating, and communication for humans and for common animals.
7-3: The student will demonstrate and understanding of the functions and interconnections of the major human body systems, including the breakdown in structure or function that disease causes.	7-3.2: Recall the major organs of the human body and their function within their particular body system.	MG 10: Identify the sense organs and the information each can collect. MG 11: Identify and describe the major organs in the respiratory, digestive, and circulatory systems.

Theme 3: Weather	
Prerequisite Skills:	<ul style="list-style-type: none"> • Illustrate and compare weather that occurs in different seasons. • Identify and describe daily weather conditions with words and symbols. • Identify safety precautions to take during severe weather.
Essence of 3–5 Standards:	<ul style="list-style-type: none"> • Water cycles through Earth’s system through evaporation, condensation, and precipitation. • Clouds form when water vapor condenses in the air that surrounds Earth. Different clouds indicate different weather patterns. • Weather data are collected with special tools and recorded on maps and charts. Collected data can be used to predict future weather. • Predictable weather conditions and patterns are associated with each season. Severe weather is associated with observable and measurable phenomena.
Essence of 6–8 Standards:	<ul style="list-style-type: none"> • Water cycles through Earth’s systems in continuous and dynamic processes that include surface and groundwater flow as well as those associated with weather. • Specific terms are given to clouds and are based on a cloud’s shape and elevation. Each is associated with weather conditions and patterns. • The movement of air in the atmosphere is directly related to storms and other weather conditions. The movement of air is described with terms such as high and low pressure systems. Severe weather is associated with rapid movement of air masses. • Specialized tools, including satellites and radar, are used to collect weather data. These data are used to predict weather and weather patterns.

Theme 3: Weather		
State Standard 3-5	3-5 Indicator Assessed	3-5 Measurement Guidelines
4-4: The student will demonstrate an understanding of weather patterns and phenomena.	4-4.1: Summarize the processes of the water cycle (including evaporation, condensation, precipitation, and runoff).	MG 12: Recognize and describe water as liquid, solid, or steam.
		MG 13: Sequence events in a rainstorm (clouds form, rain falls, and puddles dry up).
	4-4.2: Classify clouds according to their three basic types (cumulus, cirrus, and stratus) and summarize how clouds form.	MG 14: Identify and compare weather conditions today and yesterday.
		MG 15: Match weather with different types of clouds.
		MG 16: Match basic weather symbols (sun, cloud, and rain) with the observable phenomena.
	4-4.3 Compare daily and seasonal changes in weather conditions (including wind speed and direction, precipitation, and temperature) and patterns.	MG 17: Identify simple weather tools.
		MG 18: Describe temperature ranges (hot, cool, and cold) associated with daily weather.
	4-4.4: Summarize the conditions and effects of severe weather phenomena (including thunderstorms, hurricanes, and tornadoes) and related safety concerns.	
	4-4.5: Carry out the procedures for data collecting and measuring weather conditions (including wind speed and direction, precipitation, and temperature) by using appropriate tools and instruments.	MG 19: Read temperature from a thermometer.
	4-4.6: Predict weather from data collection through observation and measurements.	

Theme 3: Weather		
State Standard 6-8	6-8 Indicator Assessed	6-8 Measurement Guidelines
6-4: The student will demonstrate an understanding of the relationship between Earth's atmospheric properties and processes and its weather and climate.	6-4.2: Summarize the interrelationships among the dynamic processes of the water cycle (including precipitation, evaporation, transpiration, condensation, surface-water flow, and groundwater flow).	
	6-4.3: Classify shapes and types of clouds according to elevation and their associated weather conditions and patterns.	MG 20: Recognize examples of water as rain, hail, and clouds associated with forms of precipitation.
		MG 21: Match or sequence the flow of water from rain to streams to lakes and/or oceans.
	6-4.4: Summarize the relationship of the movement of air masses, high and low pressure systems, and frontal boundaries to storms (including thunderstorms, hurricanes, and tornadoes) and other weather conditions.	
	6-4.5: Use appropriate instruments and tools to collect weather data (including wind speed and direction, air temperature, humidity, and air pressure).	MG 22: Use simple tools to describe weather data.
		MG 23: Read data from simple tools.
		MG 24: Record and/or identify data on simple weather maps.
	6-4.6: Predict weather conditions and patterns based on weather data collected from direct observations and measurements, weather maps, satellites, and radar.	MG 25: Read a simple weather calendar.
		MG 26: Identify symbols for weather conditions.
		MG 27: Use weather symbols to predict weather for the next day.

Theme 4: Earth and Space Systems

Prerequisite Skills:

- Identify the moon and the Sun. Recall that the Sun is a source of heat and light on Earth.
- Recognize the pattern of day and night and that the Sun and the moon appear to rise, move across the sky, and set.

Essence of 3–5 Standards:

- Earth is one of many planets that orbit the Sun. Earth's position in the solar system (distance from the Sun) affects the amount of light and heat Earth receives from the Sun.
- Day and night are the result of the rotation of Earth on its axis. Seasons are the result of Earth's orbit around the Sun.
- Shadow length is related to the position of the Sun in the sky (or to the rotation of Earth on its axis).

Essence of 6–8 Standards:

- The solar system includes planets, moons, asteroids, comets, and meteors. Movement of these objects is affected by the gravitational pull of the Sun and between objects.
- The Sun is a star; the universe contains many stars and galaxies. Light-years are used to measure the distance between stars in space.
- The tilt of Earth on its axis affects the length of the day.

Theme 4:Earth and Space Systems		
State Standard 3-5	3-5 Indicator Assessed	3-5 Measurement Guidelines
4-3: The student will demonstrate an understanding of the properties, movements, and locations of objects in the solar system.	4-3.1: Recall that Earth is one of many planets in the solar system that orbit the Sun.	MG 28: Identify Earth, the moon, the Sun, and stars. MG 29: Identify the pattern of night and day.
	4-3.3: Explain how the Sun affects Earth.	MG 30: Match changes during the day (such as how warm it feels) to the time of day.
	4-3.5: Explain how the rotation of Earth results in day and night.	
	4-3.7: Interpret the change in the length of shadows during the day in relation to the position of the Sun in the sky.	
State Standard 6-8	6-8 Indicator Assessed	6-8 Measurement Guidelines
8-4: The student will demonstrate an understanding of the characteristics, structure, and predictable motions of celestial bodies	8-4.5: Explain how the tilt of Earth's axis affects the length of the day and the amount of heating on Earth's surface, thus causing the seasons of the year.	MG 31: Identify sunlight as the source of heat and light MG 32: Identify how heat and light change from season to season.

Theme 5: Earth Materials and Change

Prerequisite Skills:

- Recognize rocks, soil, sand, and water as Earth materials. Classify rocks and sand by physical appearance and compare soils by properties.
- Describe water by observable properties (feels wet, flows downhill, and takes the shape of its container) and where it is found on Earth (with maps or drawings).

Essence of 3–5 Standards:

- Earth materials (rocks, soils, and landforms, including oceans) can be described by physical properties and continually change from fast and slow processes.
- Fossils provide information about Earth’s early environments and can be found in rocks and soil.
- Some Earth materials are used for fuel, as resources for building, or for growing plants.
- Human activity, both positive and negative, affects land and water on Earth.

Essence of 6–8 Standards:

- All organisms interact with both biotic (living) and abiotic (nonliving) components of their environment. Water supply and soil quality affect the characteristics of an ecosystem.
- Food chains, food webs, and energy pyramids show the flow of energy among organisms in habitats and ecosystems.
- Earth has three main layers (crust, mantle, and core); different processes of change occur in each layer, including rock formation, mountain building, earthquakes, and plate movement.
- Earth’s resources include minerals and ores, as well as nonrenewable resources such as fossil fuels.

Theme 5: Earth Materials and Change		
State Standard 3-5	3-5 Indicator Assessed	3-5 Measurement Guidelines
3-3: The student will demonstrate an understanding of Earth's composition and the changes that occur to the features of Earth's surface.	3-3.1: Classify rocks (including sedimentary, igneous, and metamorphic) and soils (including humus, clay, sand, and silt) on the basis of their properties.	MG 33: Sort and describe rocks and soil (same different; rough, smooth)
	3-3.6: Illustrate Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands) by using models, pictures, diagrams, and maps.	MG 34: Sort and describe land features from models and/or photographs. Include hills, oceans, rivers, lakes.
	3-3.7: Exemplify Earth materials that are used as fuel, as a resource for building materials, and as a medium for growing plants.	MG 35: Relate land features to the use of natural resources for fishing, farming and mining.
	3-3.8: Illustrate changes in Earth's surface that are due to slow processes (including weathering, erosion, and deposition) and changes that are due to rapid processes (including landslides, volcanic eruptions, floods, and earthquakes).	MG 36: Relate erosion and/or run-off from heavy rain to surface features.
5-3: The student will demonstrate an understanding of features, processes, and changes in Earth's land and oceans	5-3.1: Explain how natural processes (including weathering, erosion, deposition, landslides, volcanic eruptions, earthquakes, and floods) affect Earth's oceans and land in constructive and destructive ways.	
	5-3.6: Explain how human activity (including conservation efforts and pollution) has affected the land and the oceans of Earth.	
	5-3.4: Explain how waves, currents, tides, and storms affect the geologic features of the ocean shore zone (including beaches, barrier islands, estuaries, and inlets).	

Theme 5: Earth Materials and Change		
State Standard 6-8	6-8 Indicator Assessed	6-8 Measurement Guidelines
7-4: The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environment.	7-4.2: Illustrate energy flow in food chains, food webs, and energy pyramids	
	7-4.3: Explain the interaction among changes in the environment due to natural hazards (including landslides, wildfires, and floods), changes in populations, and limiting factors (including climate and the availability of food and water, space, and shelter).	
	7-4.6: Classify resources as renewable or nonrenewable and explain the implications of their depletion and the importance of conservation.	MG 37: Identify natural resources as renewable or nonrenewable.
		MG 38: Recognize that recycling paper and cans conserves resources. MG 39: Identify items that can be recycled.
8-2: The student will demonstrate an understanding of Earth's biological diversity over time.	8-2.1: Explain how biological adaptations of populations enhance their survival in a particular environment.	
	8-2.3: Explain how Earth's history has been influenced by catastrophes (including the impact of an asteroid or comet, climatic changes, and volcanic activity) that have affected the conditions on Earth and the diversity of its life-forms.	
8-3: The student will demonstrate an understanding of materials that determine the structure of Earth and the processes that have altered this structure.	8-3.5: Summarize the importance of mineral, ores, and fossil fuels as Earth resources on the basis of their physical and chemical properties.	

Theme 6: Properties of Matter and Energy

Prerequisite Skills:

- Sort, describe, and classify objects and liquids by their observable properties. Compare the properties of different types of materials.
- Mix materials. Describe materials that can be separated after mixing and those that cannot be separated.
- Describe how heating, cooling, cutting, and bending can change materials.

Essence of 3–5 Standards:

- Materials can be described and classified as solids, liquids, or gases. Materials change state when heated or cooled.
- Heat (thermal energy) can be produced by rubbing, burning, and using electricity. Thermal energy moves from warmer to cooler materials through conduction.
- Conductors transfer thermal energy and electricity better than other materials; insulators do not transfer thermal energy or electricity easily.
- Light has observable and measurable properties.
- A complete circuit (battery, wires, and closed switch) can transform electricity into other forms of energy, including light, heat, and magnetism.

Essence of 6–8 Standards:

- Some materials can be combined into mixtures that can be separated back into their components; other materials combine to form solutions.
- Matter can be classified as elements, compounds, or mixtures on the basis of observable and measurable properties. Metals have unique properties not shared by nonmetals.
- Energy is the ability to do work; forms of energy include heat, solar, chemical, mechanical, and electrical.
- Magnetism and electricity are interrelated. Electricity can be transformed to produce light, heat, sound, and mechanical motion.
- Simple machines reduce the amount of force required to do work. Simple machines exist in common tools and complex machines.

Essence of HS Standards:

- Some energy is kinetic, or related to movement; other energy is potential, or stored. Energy cannot be created or used up; it can be transferred or transformed from one form to another.
- Electricity is a form of energy that exists in nature and can be generated from other forms of energy. An electric current can be represented with diagrams, measured, or calculated.
- Waves transmit energy; there are mechanical and electromagnetic waves. Wavelength in the electromagnetic spectrum is related to energy and how the wave behaves.
- Vibrations produce sound energy. Variables that affect the sound heard or felt include the length, width, and tension of the vibrating object. Changing the frequency of the vibration will change pitch but not loudness.
- Light is a form of energy with special properties related to wavelength. These properties can be measured, represented mathematically, and predicted.

Theme 6: Properties of Matter and Energy		
State Standard 3-5	3-5 Indicator Assessed	3-5 Measurement Guidelines
3-4: The student will demonstrate an understanding of the changes in matter that are caused by heat.	3-4.1: Classify different forms of matter (including solids, liquids, and gases) according to their observable and measurable properties.	MG 40: Sort and describe materials by observable properties.
	3-4.2: Explain how water and other substances change from one state to another (including melting, freezing, condensing, boiling, and evaporating).	MG 41: Identify water in solid and liquid form.
State Standard 6-8	6-8 Indicator Assessed	6-8 Measurement Guidelines
6-5: The student will demonstrate an understanding of the law of conservation of energy and the properties of energy and work.	6-5.6: Recognize that energy is the ability to do work (force exerted over a distance).	
	6-5.7: Explain how the design of simple machines (including levers, pulleys, and inclined planes) helps reduce the amount of force required to do work.	MG 42: Identify and describe simple machines (inclined planes and levers).
		MG 43: Identify how simple machines are used to help people (levers).
	6-5.8: Illustrate ways that simple machines exist in common tools and in complex machines.	
7-5: The student will demonstrate an understanding of the classifications and properties of matter and the changes that matter undergoes.	7-5.3: Compare the physical properties of metals and nonmetals.	MG 44: Sort by metal and non-metal using properties related to metals.

State Standard HS	HS Indicator Assessed	HS Measurement Guidelines
PS-3: The student will demonstrate an understanding of various properties and classifications of matter	PS-3.5: Explain the effects of temperature, particle size, and agitation on the rate at which a solid dissolves in a liquid.	MG 45: Recognize and describe water as a liquid and solid.
PS-6: The student will demonstrate an understanding of the nature, conservation, and transformation of energy.	PS-6.3: Explain work in terms of the relationship among the force applied to an object, the displacement of the object, and the energy transferred to the object.	MG 46: Relate the force needed to move an object to the location of the force on the object.
	PS-6.9: Compare the functioning of simple series and parallel electrical circuits.	MG 47: Trace the flow of electricity through a simple circuit.
		MG 48: Identify the role of a switch and examples of how electric energy is transferred to light and heat energy.
PS-7: The student will demonstrate an understanding of the nature and properties of mechanical and electromagnetic waves.	PS-6.11: Explain the relationship of magnetism to the movement of electric charges in electromagnets, simple motors, and generators.	MG 49: Investigate objects that respond to a magnet, conduct electricity, and insulate against heat.
	PS-7.1: Illustrate ways that energy of waves is transferred by interaction with matter (including transverse and longitudinal/compressional waves).	
	PS-7.3: Summarize characteristics of waves (including displacement, frequency, period, amplitude, wavelength, and velocity as well as the relationships among these characteristics).	MG 50: Explore how vibrations travel through different material to make different sounds.

Theme 7: Exploring Force and Motion

Prerequisite Skills:

- Identify the location of an object relative to another object. Explain how pushing and pulling can change the location of an object.
- Describe ways that objects can move in terms of direction and relative speed.
- Describe sound as the vibration of an object.
- Explore how magnets can make objects move, including how magnets react to the poles on other magnets.

Essence of 3–5 Standards:

- The motion of an object is affected by force; forces include gravity, friction, and magnetism as well as pushing and pulling.
- Changing a force changes the motion and direction of an object.
- Motion can be described by position and direction, measured, and represented with distance-over-time graphs.
- Vibrations produce sounds. Sounds can be described by pitch and volume; changing the vibrations changes the sound produced.

Essence of 6–8 Standards:

- Waves transmit energy, not matter. Waves can be reflected, absorbed, and refracted. Hearing and vision (including the perception of color) depend on wave motion.
- Magnitude of the force (including balanced and unbalanced forces) along with mass of the object determines the direction and the speed of the object.
- Without friction and gravity, objects that are moving would continue to move; without an initial force, objects will not move (inertia).
- Graphs and formulas can be used to find speed and represent changes in the motion of an object.

Essence of High School Standards:

- Speed and acceleration of an object can be measured or calculated with a formula and described with a variety of graphs.
- The speed of an object is related to the force required to move the object, its initial acceleration, and its mass.
- When a force is applied to an object, the object reacts by moving in the opposite direction to the force. Multiple forces on an object can be represented with vector graphs.
- Inertia means that objects that are not moving will move only when a force is applied and that objects that are moving will stop only when a force is applied.

Theme 7: Exploring Force and Motion		
State Standard 3-5	3-5 Indicator Assessed	3-5 Measurement Guidelines
3-5: The student will demonstrate an understanding of how motion and sound are affected by a push or pull on an object and the vibration of an object.	3-5.1: Identify the position of an object relative to a reference point by using position terms such as “above,” “below,” “inside of,” “underneath,” or “on top of” and a distance scale or measurement.	MG 51: Identify the position of two or more objects by using a reference point.
	3-5.2: Compare the motion of common objects in terms of speed and direction.	MG 52: Compare the motion of two rolling objects (such as toy cars or balls) and identify the force (push or pull) that initiated the motion.
State Standard 6-8	6-8 Indicator Assessed	6-8 Measurement Guidelines
8-5: The student will demonstrate an understanding of the effects of forces on the motion of an object.	8-5.3: Analyze the effects of forces (including gravity and friction) on the speed and direction of an object.	MG 53: Identify how changing the mass (size and weight) of an object affects how far and/or how fast an object moves.
	8-5.4: Predict how varying the amount of force or mass will affect the motion of an object.	MG 54: Identify how changing the force on an object (pushing, pulling, dropping) affects how far and/or how fast the object moves. Recognize that a harder push makes an object moves faster.

Theme 7: Exploring Force and Motion		
State Standard HS	HS Indicator Assessed	HS Measurement Guidelines
PS-5: The student will demonstrate an understanding of the nature of forces and motion.	PS-5.4: Use the formula $a=(v_f-v_i)/t$ to determine the acceleration of an object.	MG 55: Identify or match surfaces that can speed up motion and those that can slow down motion.
	PS-5.5: Explain how acceleration due to gravity affects the velocity of an object as it falls.	MG 56: Investigate how to increase the speed of a falling object with a push.
	PS-5.7: Explain the motion of objects on the basis of Newton's three laws of motion: inertia; the relationship among force, mass, and acceleration; and action and reaction forces.	MG 57: Relate the material of a falling object to the reaction when the object hits the ground.
		MG 58: Identify the force that makes an object move.
		MG 59: Relate the change in force to the change in speed.
	PS-5.8: Use the formula $F=ma$ to solve problems related to force.	MG 60: Show how to make an object at rest begin to move and how to stop a moving object.
		MG 61: Investigate how to increase the speed of a falling object with a push.
	PS-5.10: Explain how the gravitational force between two objects is affected by the mass of each object and the distance between them.	